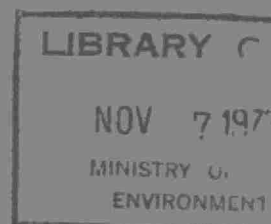


1972

OPERATING SUMMARY

FERGUS



1972-1973
Fergus
Operating Summary

TD227
F47
W38
1972
MOE

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Ontario

Ministry of the
Environment

135 St. Clair Avenue West
Toronto 195, Ontario

We are pleased to present you with the 1972 operating summary for the water pollution control plant serving your community.

This summary contains data on the performance of the plant as well as relevant financial information. Of particular interest is the review of the year's activities in which significant items of these data are discussed in some detail by the operations engineer and his staff who, by their day-to-day involvement with the operation, are thoroughly familiar with the plant.

We appreciate your continuing interest in protecting the environment through the efficient operation of this wastewater treatment facility.

D.S. Caverly,
Assistant Deputy Minister.

D.A. McTavish, P. Eng.,
Director,
Project Operations Branch.

TD
227
F47
W38
1972
MOE

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DEPUTY MINISTER
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D. S. Caverly

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ACTING REGIONAL SUPERVISOR
B. W. Hansler

OPERATIONS ENGINEER
J. Nurmberg

135 St. Clair Avenue West
Toronto 195

FERGUS
WATER POLLUTION CONTROL PLANT

operated for
THE TOWN OF FERGUS
by the
MINISTRY OF THE ENVIRONMENT

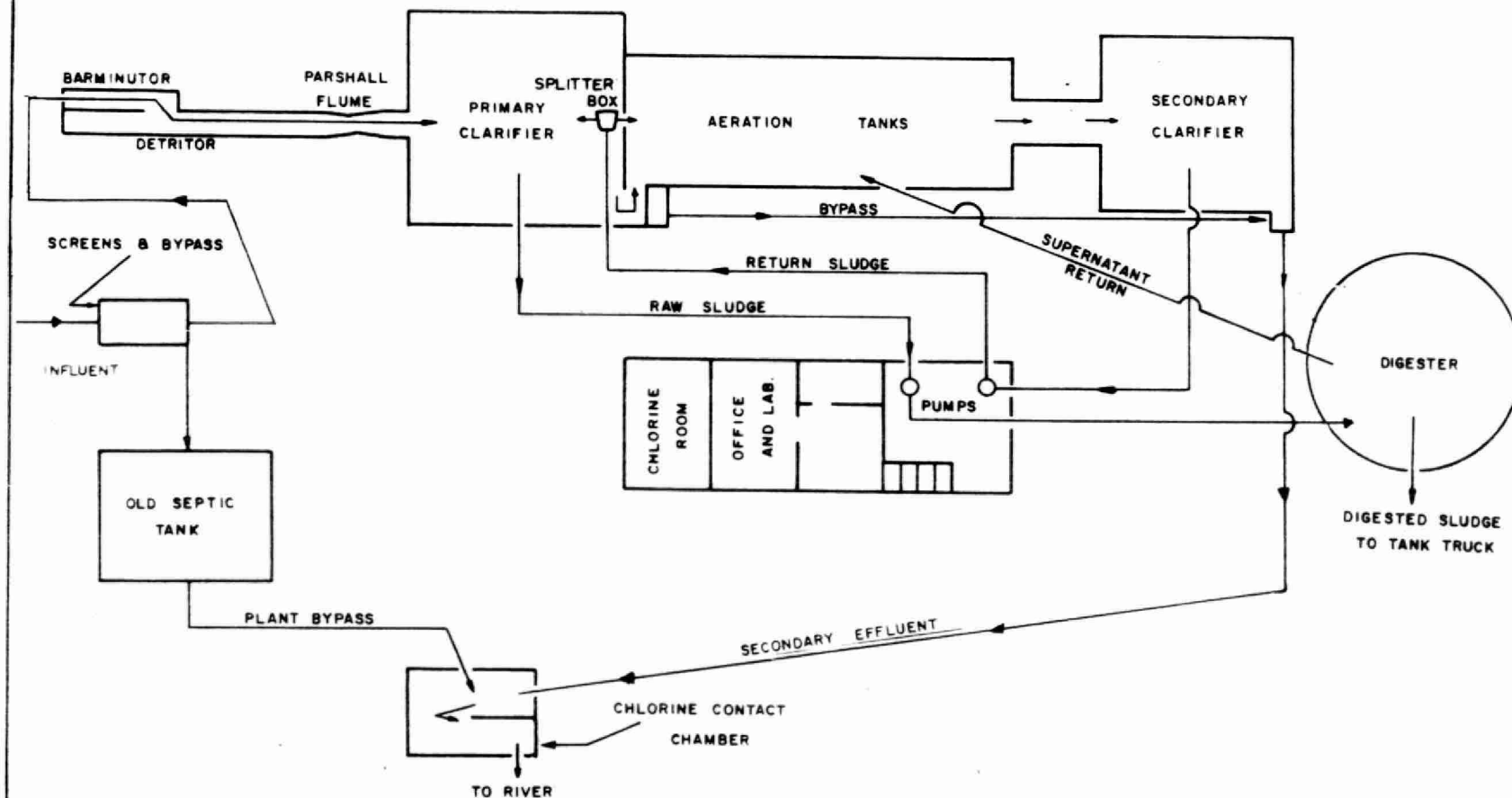
1972 ANNUAL OPERATING SUMMARY

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FERGUS

water pollution control plant



DESIGN DATA

PROJECT NO. 2-0023-58

TREATMENT Activated Sludge

DESIGN FLOW 0.6 mgd

DESIGN POPULATION 4,700

BOD - Raw Sewage 200 mg/l
- Removal 90%

SS - Raw Sewage 200 mg/l
- Removal 90%

PRIMARY TREATMENT

Grit Removal

Type: Dorr-Oliver, Type T
Detritor

Comminution

Type: Barminutor
Size: Model B (18")

Primary Sedimentation

Type: Dorr-Oliver
Size: One 40' x 40' x 9' swd
(90,000 gal)
Retention: 3.6 hours
Loading: Surface, 267 gal/ft²/day
Weir, 2,670 gal/ft/day

SECONDARY TREATMENT

Aeration Tank

Type: Mechanical, single pass
Size: One 72' x 24' x 10' 7" swd
(22,000 cu ft or 137,500 gal)
Retention: 5.5 hours

Aerators

- Three Ames Crosta driven by a single motor

Secondary Sedimentation

Type: Dorr-Oliver
Size: One 35' x 35' x 9' swd
(11,000 cu ft or 68,500 gal)
Retention: 2.74 hours
Loading: Surface, 490 gal/ft²/day
Weir, 4,280 gal/ft/day

CHLORINATION

Type: BIF Model EVS
Size: 200 lb/day

Chlorine Contact Chamber

Size: 13½' (avg) x 12' x 6' deep
(911 cu ft or 5,670 gal)
Retention: 15 min

OUTFALL

- to Grand River

SLUDGE HANDLING

Digestion System

Type: Single stage, with floating cover
and one Dorr draft tube mixer
Size: 35' dia x 22' swd (22,700 cu ft or
141,000 gal)
Loading: 1.40 lb/ft³/mo

Drying Beds

- total area, 7,200 sq ft
(discontinued use in 1964)

'72 Review

GENERAL

The Fergus Water Pollution Control Plant is a 1.1 mgd conventional activated sludge plant consisting of grit removal facilities, primary settling, aeration, final settling, chlorination and single stage anaerobic sludge digestion facilities.

During the year both the Fergus and Elora Water Pollution Control plants were operated by a staff of two stationed at Fergus.

Under the supervision of head office engineers, staff operated a clean, attractive and efficient plant for the Town of Fergus.

EXPENDITURES

The total operating cost for the year was \$30,938.97 or \$176.10 per million gallons of sewage treated. The unit cost of removing one pound of BOD was 16.1 cents while the cost of removing one pound of suspended solids was 8.5 cents.

PLANT FLOWS AND CHLORINATION

Due to the repair problems associated with the flowmeter, an accurate measurement of flows only for the period July to December was obtained. This six month total is 79.3 million gallons representing an average daily flow of 0.48 mgd or 44 percent of the design value.

An average chlorine dosage of 6.1 mg/l was required to maintain an average chlorine residual in the final effluent of 0.5 mg/l.

AERATION

An average MLSS concentration of 2415 mg/l resulting in an F/M ratio of 0.09 was maintained in the aeration section.

PLANT EFFICIENCY

The average BOD and suspended solids concentration in the influent were 123 and 170 mg/l respectively. The average effluent BOD and suspended solids concentrations were 16 and 23 mg/l respectively. Removal efficiencies for BOD and suspended solids were 87 percent for both BOD and suspended solids.

CONCLUSIONS

Construction to expand the plant to 1.1 mgd was completed in early 1972 with the expanded plant placed in operation in February resulting in fairly efficient treatment results.

PROJECT COSTS

2-0023-58
 NET CAPITAL COST \$277,393.48
 DEDUCT - Portion financed by

Long Term Debt to MOE \$277,393.48

Debt Retirement Balance at Credit
 (Sinking Fund) December 31, 1972 \$165,292.26

Net Operating \$ 30,941.97
 Debt Retirement 4,397.00
 Reserve 1,298.46
 Interest Charged 15,555.94

TOTAL \$ 52,193.37

RESERVE ACCOUNT

Balance @ January 1, 1972 \$ 15,746.13

Deposited by Municipality 1,298.46

Interest Earned 1,037.13

\$ 18,081.72

Less Expenditures 323.07

Balance @ December 31, 1972 \$ 17,758.65

PROJECT COSTS

2-0264-69	
NET CAPITAL COST	\$337, 956. 92
DEDUCT - Portion financed by CMHC (final)	<u>(215, 015. 48)</u>
Long Term Debt to MOE	<u>\$122, 941. 44</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1972	\$ <u>2, 334. 00</u>
Net Operating	\$ -
Debt Retirement	2, 334. 00
Reserve	2, 171. 00
Interest Charged	<u>8, 934. 22</u>
TOTAL	\$ <u>13, 439. 22</u>

RESERVE ACCOUNT

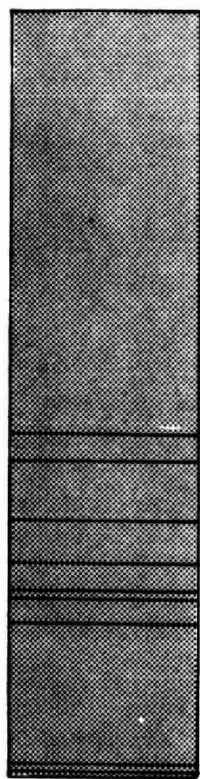
Balance @ January 1, 1972	\$ -
Deposited by Municipality	2, 171. 00
Interest Earned	<u>-</u>
	\$ 2, 171. 00
Less Expenditures	<u>-</u>
Balance @ December 31, 1972	\$ <u>2, 171. 00</u>

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	1465.09	1465.09										
FEB	3028.48	1529.91		107.26	639.46	278.25	61.09		20.58	377.53	8.10	6.30
MAR	2368.52	853.35		230.95	350.98	278.25	139.12	71.66	34.25	399.01		10.95
APR	2988.18	1590.10			305.98		237.64		329.29	400.64	114.48	10.05
MAY	2879.55	1640.66		312.43	305.98		26.88		191.02	356.11	40.32	6.15
JUNE	3784.33	2200.13	480.00		258.98		126.70		349.60	314.17	37.80	16.95
JULY	1399.38	38.37		112.62	258.98	372.00	61.29	78.23	57.58	400.00	12.96	7.35
AUG	2279.37	1465.36	380.16		239.48		93.95		72.60	(2.06)	19.68	10.20
SEPT	3131.44	1532.99	327.07		278.48	177.00	266.26	9.80	11.50	506.77	18.72	2.85
OCT	2794.88	1780.42	101.74		287.40		141.44	72.41	84.86	317.01	9.60	
NOV												
DEC	4819.75	2068.38	(18.86)	107.33	629.85	488.83	307.38		162.37	1002.20	3.00	68.37
TOTAL	30938.97	16164.76	1270.11	870.59	3555.57	1594.33	1461.75	232.10	1314.55	4071.38	264.66	139.17

Brackets indicate credit.

* Sundry includes sludge haulage costs of \$3,504.00



OPERATING COSTS

● PAYROLL	56 %
● FUEL	4 %
● POWER	8 %
● CHEMICALS	5 %
● GENERAL SUPPLIES	4 %
● EQUIPMENT	< 1 %
● REPAIRS & MAINTENANCE	3 %
● SUNDRY	18 %
● WATER	< 1 %
● TRAVEL	1 %

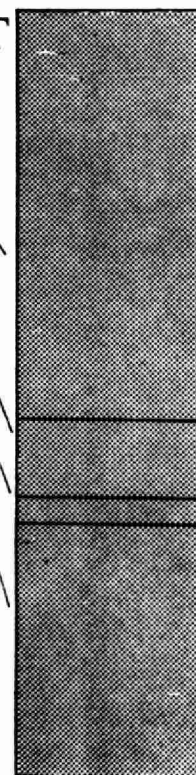
1971 COSTS

TOTAL ANNUAL COST

● NET OPERATING	53 %
● DEBT RETIREMENT	10 %
● RESERVE	3 %
● INTEREST	34 %

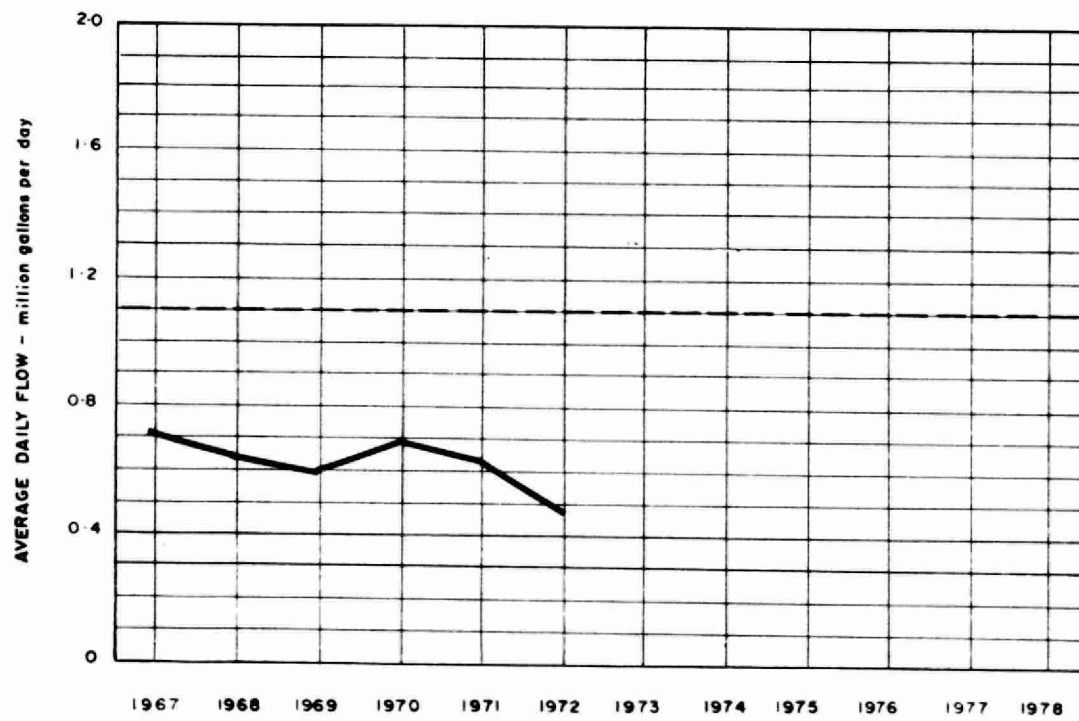
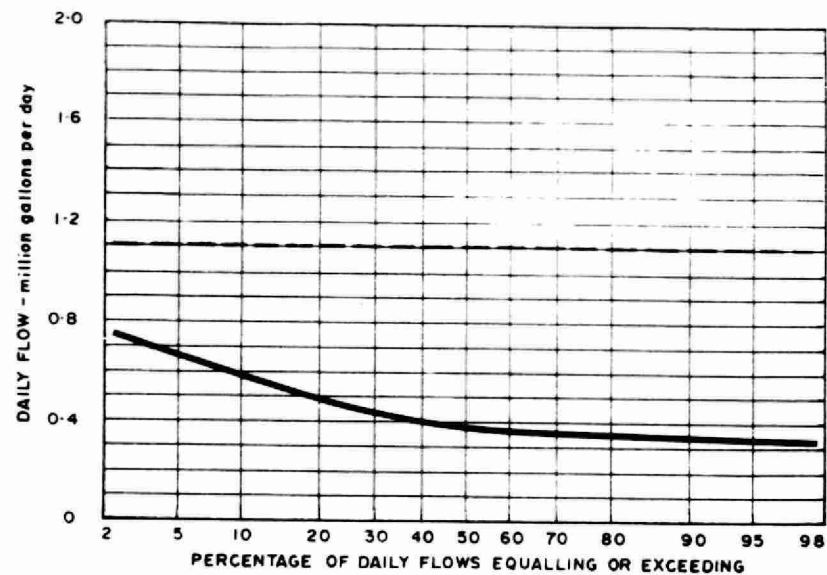
YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			\$ per million gal	¢ per lb BOD
1967	258.03	\$20,388.07	\$ 79.01	6 cents
1968	229.31	22,150.62	96.60	6 cents
1969	235.40	25,448.57	108.11	10 cents
1970	254.50	24,078.25	94.61	13 cents
1971	230.4	24,545.70	106.50	9 cents



PROCESS DATA

FLows

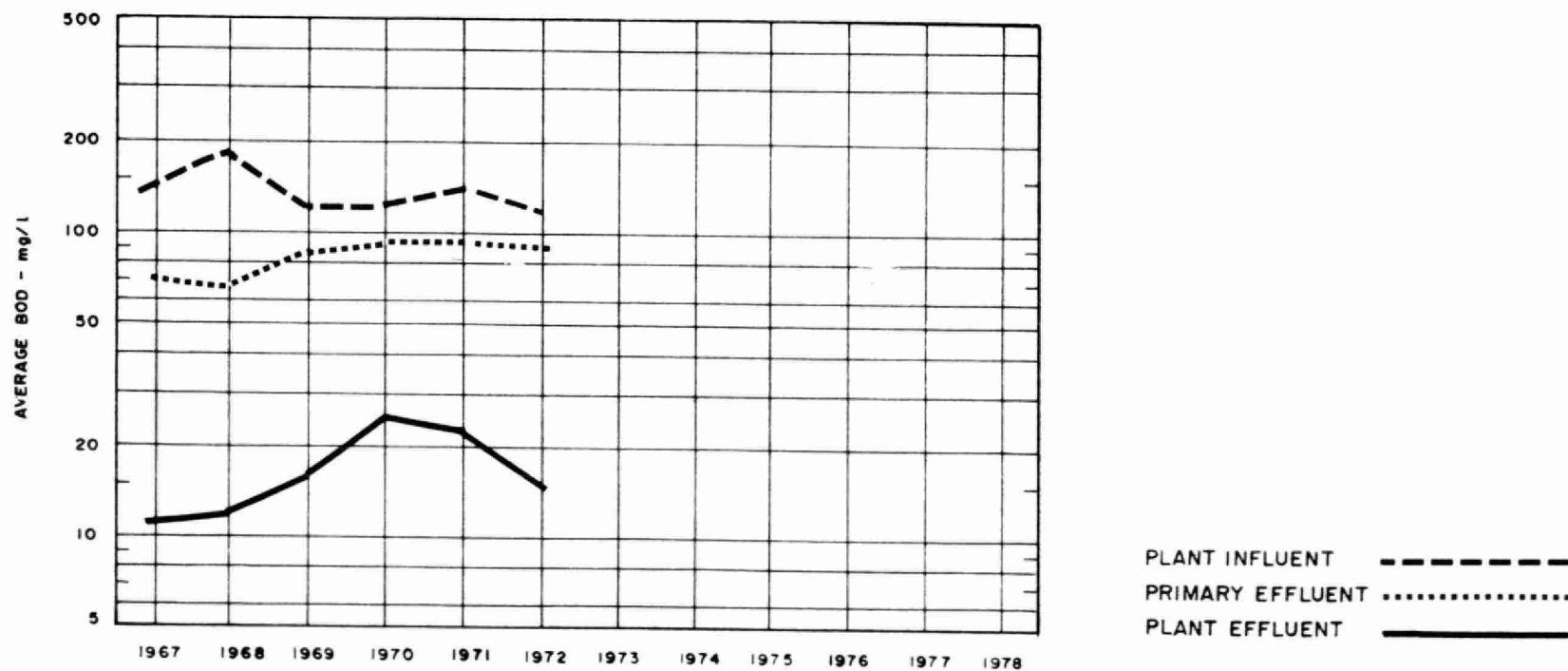
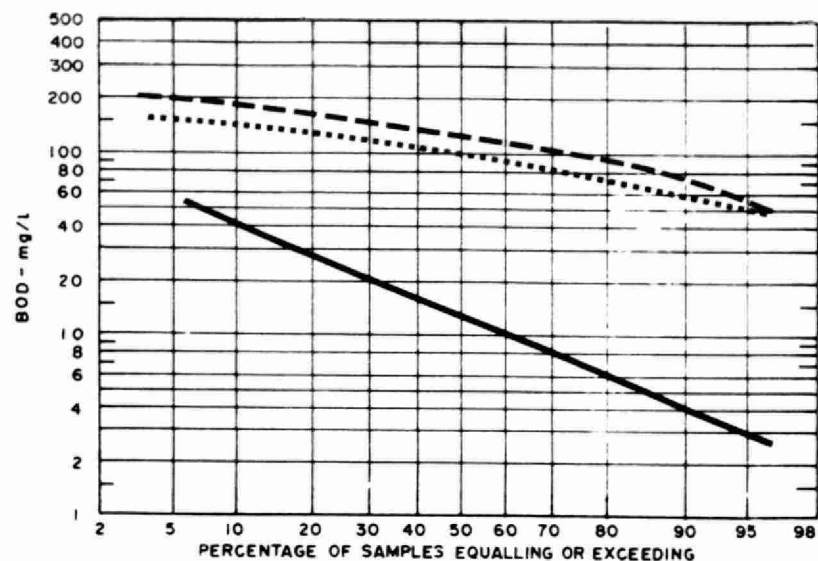


PLANT PERFORMANCE

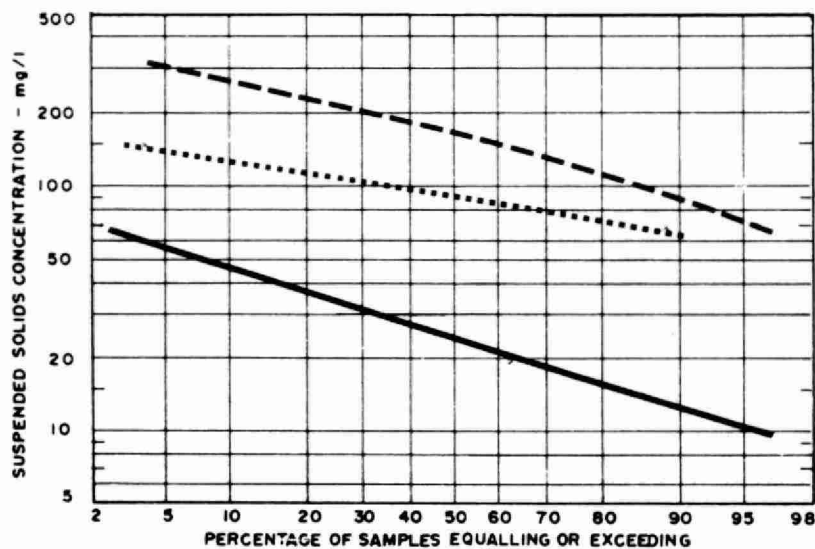
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 ³ pounds			%	10 ³ pounds		
JAN				130	37	78		150	20	90		10.8	4.2
FEB				165	49	70		201	41	8.0		10.2	7.0
MAR				143	13	91		152	19	87		8.1	3.4
APR				52	10	81		115	22	81		3.3	2.5
MAY				95	11	92		124	19	85		7.7	4.3
JUNE				100	22	78		206	21	90		5.5	4.9
JULY	* 12.4	.40	.45	100	10	90	11	155	20	86	17	8.0	5.0
AUG	10.6	.34	.49	190	4	98	20	207	17	92	20	11.0	6.5
SEPT	10.3	.34	.46	127	4	97	13	213	19	91	20	13.0	7.6
OCT	13.2	.44	.90	140	5	96	18	218	18	92	26	12.0	6.5
NOV	15.1	.50	.71	140	5	96	20	200	16	92	28	9.8	5.4
DEC	17.7	.57	.92	110	20	82	16	148	25	83	22	10.6	5.4
TOTAL		-	-	-	-	-		-	-	-		-	-
AVG.		.48	MAXIMUM .92	123	16	87		170	23	87		9.2	5.1
No. of Samples	-	-	-	23	23	-	-	72	263	-	-	23	23




* Flow meter returned to service July 20

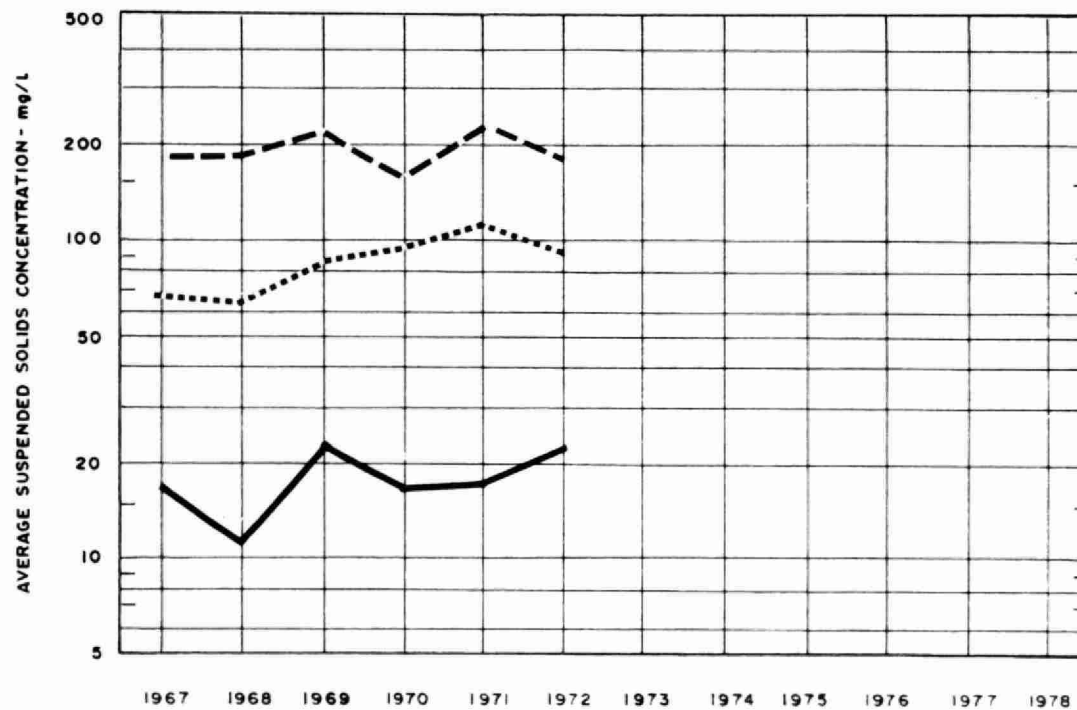
BIOCHEMICAL OXYGEN DEMAND



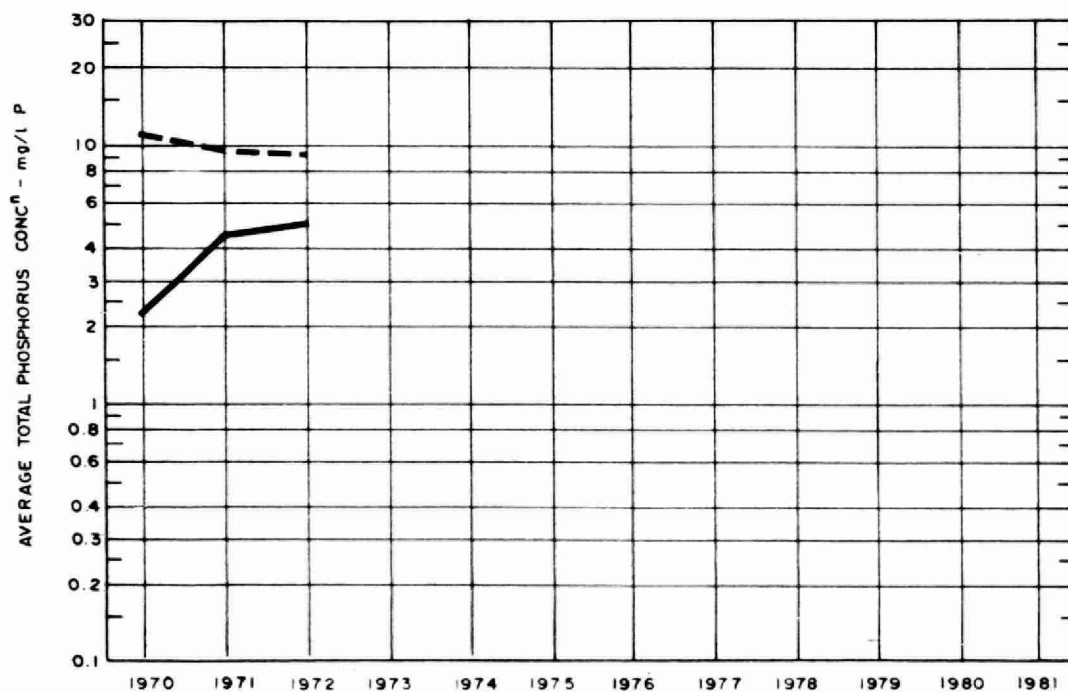
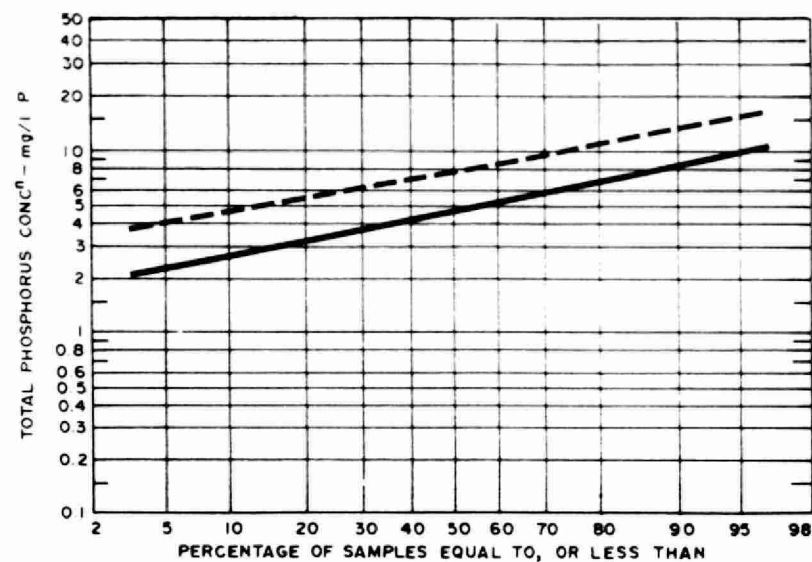
SUSPENDED SOLIDS



PLANT INFLUENT 
 PRIMARY EFFLUENT 
 PLANT EFFLUENT 



PHOSPHORUS

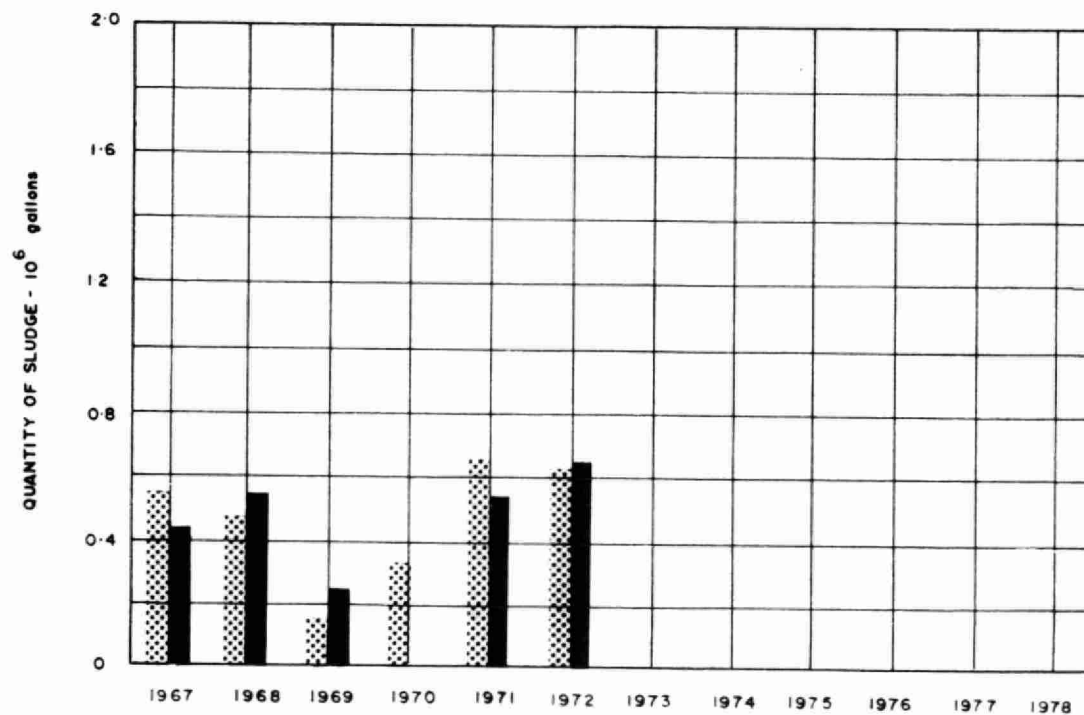
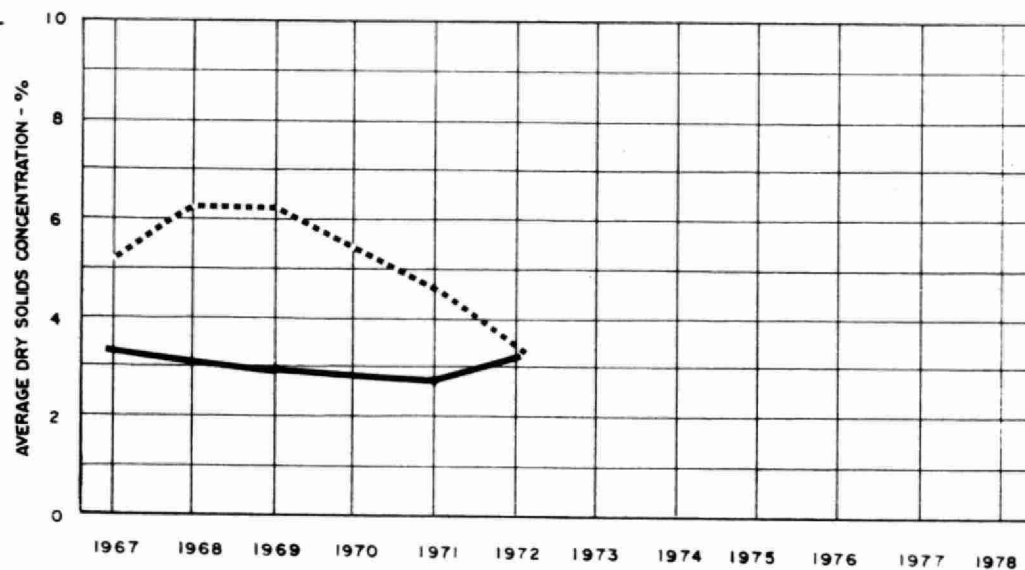


PLANT INFLUENT - - - - -

PLANT EFFLUENT —————

DIGESTION

RAW SLUDGE
DIGESTED SLUDGE ———



RAW SLUDGE TO DIGESTER ▨
DIGESTED SLUDGE REMOVED ■

TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL ₂ USED 10 ³ pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day ⁻¹	AIR 1000 ft ³ lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	15.0	847		98	92	3180			56.9							360
FEB	3.0	772		120	110	2330			48.7							
MAR	9.0	900		83	99	2570			53.0				3.9	56		360
APR	22.5	981		32	49	2450			57.2							248
MAY	22.5	838		65	81	2230			53.0							296
JUNE	18.0	907		632	126	1940			50.4							400
JULY	14.0	932	7.5	65	102	2280	.06		53.0							256
AUG	15.5	870	8.2	100	97	2340	.10		53.4							232
SEPT	3.0	762	7.4	112	110	2380	.07		50.4							256
OCT	9.0	670	5.1	100	93	2580	.09		54.3	3.5	71					384
NOV	6.0	665	4.4	105	103	2480	.10		42.7							248
DEC	9.0	667	3.8	80	82	2220	.10		47.7	3.1	74		2.4	63		392
TOTAL	146.5	9811	-	-	-	-	-	-	620.7	-	-		-	-	-	3792
AVG.	0.8 cu. ft./mil gal	818	6.1		94	2415	.09		51.7	3.3	73		3.2	60		316

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